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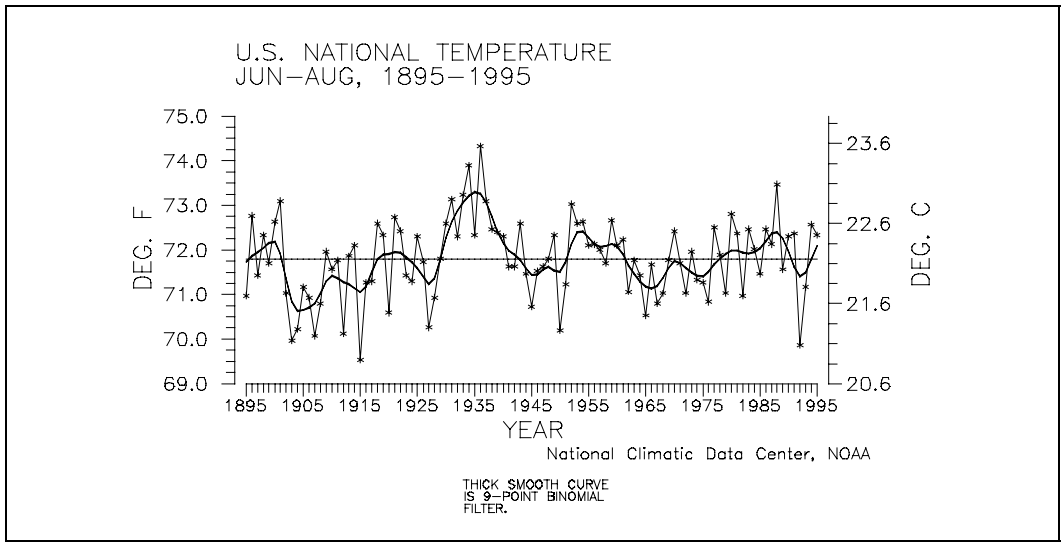
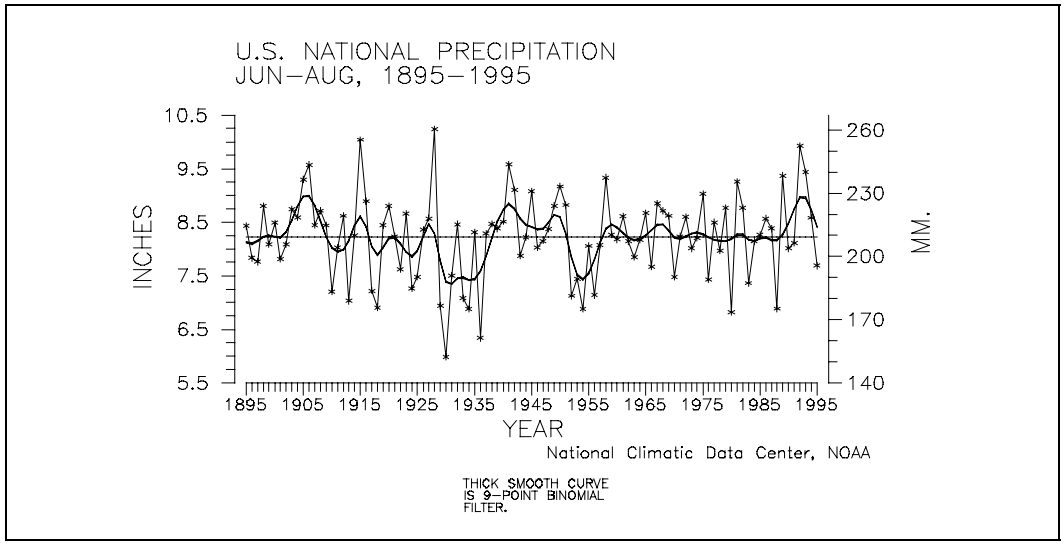
CLIMATE VARIATIONS BULLETIN





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This CLIMATE VARIATIONS BULLETIN (CVB) is a preliminary report that puts current monthly climate anomalies into historical perspective using climate databases archived at the National Climatic Data Center (NCDC). It is issued on a monthly basis. Supplemental sections are included which address seasonal and annual perspectives, when appropriate.

Current data are based on preliminary reports from First and Second Order airport stations obtained from the National Weather Service (NWS) Climate Analysis Center, and preliminary tornado statistics obtained from the NWS National Severe Storms Forecast Center. THE CURRENT DATA SHOULD BE USED WITH CAUTION. These preliminary data are useful for estimating how current anomalies compare to the historical record, however the actual values and rankings for the current year will change as the final data arrive at NCDC and are processed.

The following NCDC datasets are used for the historical data: the climate division drought database (TD-9640), the hurricane datasets (TD-9636 and TD-9697), the tornado dataset (STORM DATA), and the monthly station dataset (LCD supplemental files). It should be noted that the climate division drought database consists of monthly data for 344 climate divisions in the contiguous United States. These divisional values are calculated from the 6000+ station Cooperative Observer network.

The narrative, tables, and graphs in the CVB are also available via automated facsimile. The previous month's summary can be obtained after the tenth of the month by dialing 704-271-4570 and selecting the appropriate menu codes. A touch-tone fax machine is required.

If you have access to the Internet, copies of the CVB are available via both the NCDC's World Wide Web (WWW) server and the NCDC's anonymous FTP server.

NCDC's WWW server
URL for the CVB: http://www.ncdc.noaa.gov/publications/cvb/cvb.html

NCDC's anonymous FTP server
Machine: ftp.ncdc.noaa.gov
Directory: /pub/data/cvb

If you are a climate researcher and would like to order copies of the historical datasets used to make graphs of the type in this report, call 704-271-4994 or fax a letter to 704-271-4876 or mail a letter to the address given below, ATTN: Research User Services.

All other questions or requests for data should be made by calling 704-271-4800 or sending a fax to 704-271-4876 or by writing to:

National Climatic Data Center, NOAA
Federal Building
151 Patton Avenue, Room 120
Asheville, NC 28801-5001

If you use any of the information from this CVB, please identify "National Climatic Data Center, NOAA" as the source.

UNITED STATES AUGUST CLIMATE IN HISTORICAL PERSPECTIVE

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Preliminary data for August 1995 indicate that temperature averaged across the contiguous United States was much above the long-term mean (see Figure 1). August 1995, with an averaged temperature of 74.8° (F), ranked as the fourth warmest August since national records began in 1895. The 1995 value is based on preliminary data, which has been shown to be within 0.26°F (0.14°C) of the final data over a 46-month period. This confidence interval is indicated in the figure by '+'. The darker smooth curve is a nine-point binomial filter that averages out the year-to-year fluctuations and shows the longer-term variations. Fifty percent of the country averaged much warmer than normal while only four percent of the country averaged much cooler than normal for August 1995.

With an areally-averaged national precipitation value of 2.33 inches, August 1995 was the 26th driest August on record. The preliminary value for precipitation is estimated to be accurate to within 0.14 inches (3.56 millimeters) and the confidence interval is plotted in Figure 2 as a '+'. Over a fourth (27.9%) of the country experienced much drier than normal conditions while only seven percent was much wetter than normal.

Historical precipitation is shown in a different way in Figure 3. The August precipitation for each climate division in the contiguous U.S. was first standardized using the gamma distribution over the 1931-90 period. These gamma-standardized values were then weighted by area and averaged to determine a national standardized precipitation value. These national weighted values were then normalized over their period of record. Negative values are drier and positive values are wetter than the mean. This index gives a more accurate indication of how precipitation across the country compares to the local normal (60-year average) climate. The national standardized precipitation ranked August 1995 as the fourth driest such month on record.

In order to show more of a historical perspective, the precipitation and temperature rankings for the periods August 1995, July-August 1995, March-August 1995, and September 1994-August 1995 for the nine climatically homogeneous regions, as well as the national rankings, are listed in Table 1.

The regional rankings for temperature for the month of August indicate that both the Central and Southwest regions each had their third warmest August since records began in 1895. It was the fifth warmest August for the Southeast region and the sixth warmest August on record for the East-North Central region. To the other extreme, it was the 12th coolest August on record for the Northwest region. The remaining regions were all within the warm-third of the historical distribution for the month of August. Overall warmth was the general rule as well for the two-month period, July-August. Every region of the country was within the warm half of the historical distribution except for the Northwest region.

August 1995 continued the trend of drier than normal conditions for the Northeast and Southwest regions. It was the second driest August on record for the Northeast region and the eighth driest August since 1895 for the Southwest. The July-August and the March-August periods for the Northeast region are the third driest and driest, respectively, for the 101-year period of record. The two month period, July-August, is the driest on record for the Southwest region. The twelve-month period is also the second driest such period on record for the Northeast region. The East-North Central region had their 13th wettest August on record attributed mainly to scattered convective activity.

National averaged temperature for the eight month period January-August for 1895-1995 is shown in Figure 4. The January-August 1995 temperature was above the long-term mean ranking as the 16th warmest such period since 1895. Nine of the last ten such January through August periods have had temperatures above to much-above the long-term mean. For the year-to-date, none of the country has

averaged much cooler than normal while a tenth (10.5%) of the country has averaged much warmer than normal.

Figure 5 shows the historical January-August national averaged precipitation. The year-to-date for 1995 was the 13th wettest such eight-month period since records began. Six of the last seven January-August periods averaged above to much above normal, which stands in sharp contrast to the dryness of the mid to late 1980's. For the year-to-date, nine percent of the country has averaged much drier than normal while over seventeen percent of the country has averaged much wetter than normal. When the local normal climate is taken into account, January-August 1995 ranked as the 13th wettest such period since 1895 (Figure 6).

Figure 7A shows, in illustrative map form, the August 1995 temperature rankings for the 48 contiguous states. Twenty-four states were within the top ten warmest category of the historical distribution for the month of August including six (KY, LA, NM, OH, TN, & WV) which had their warmest August on record. It was the second warmest August since 1895 for Arizona, Pennsylvania and Virginia and the third warmest August in the 101-year period of record for Alabama, Illinois, Maryland, and Wisconsin. A total of 41 states were within the warm third of the historical distribution. To the other extreme, August 1995 was the eighth coolest such month on record for Oregon and the eleventh coolest since 1895 for Washington.

August 1995 state ranks for precipitation are shown in Figure 7B. It was the driest August on record for Virginia, the second driest August on record for Pennsylvania and Wyoming, and the third driest August since 1895 for Arkansas, Massachusetts, New Jersey, and New Mexico. A total of 13 states were within the top ten dry portion of the historical distribution while an additional ten were within the dry third of the distribution. Once again however, extremes were noted. It was the wettest August on record for Wisconsin and the eighth wettest August on record for Ohio and South Carolina. The South Carolina anomaly was due to the remnants of Tropical Storm Jerry which passed through the state during the last weekend of the month. Several reporting sites documented rainfall amounts in excess of ten inches for the event while one unofficial observer in the upstate region reported 20 inches of rain for the event! Nine other states were within the wet third of the distribution. It must be stressed that, when the final values for precipitation are calculated, these ranks *WILL* change due to the use of a denser station network. ***It should also be noted that the August state precipitation ranks are preliminary and should be used with considerable caution due to the high variability of precipitation on a small space and time scale.***

State temperature and precipitation ranks for the eight-month period, January-August 1995, are shown in map form in Figures 8A and 8B. Unlike the month of August, the year to date shows much less extreme rankings for temperature. Only three states (MD, NH, RI) were within the top ten warm category while an additional 32 states were within the warm third of the distribution. No states were within the cool third of the historical distribution (Figure 8A). It was the driest year-to-date for New Jersey and New York, the third driest for New Mexico, Pennsylvania and Vermont, and the fifth driest year-to-date for Delaware (Figure 8B). Four other states were within the top ten dry portion of the distribution along with an additional seven within the dry third of the distribution. It was the wettest year-to-date for California and the second wettest such period for Nevada. Five other states were among the top ten wettest year-to-date while an additional fifteen were within the wet third of the distribution.

There was a slight increase in the percent area of the country experiencing severe to extreme drought while the portion of the country dominated by severe to extreme wetness fell nearly five percent. Nationally, long-term drought conditions (as defined by the Palmer Drought Index) for August 1995 increased to 8.7% of the country while the percent coverage of severe to extreme wet area fell to about a quarter of the country (Figure 9). Table 2 lists the precipitation ranks and statistics for selected river basins for the 1994-1995 Hydrologic Year thus far. The core wet areas included the northern and central Great Plains, central high Plains, the northern and central Rockies, the Great Basin, the interior Northwest and California. The Palmer dry areas included parts of the southern High Plains, southern Rockies, mid-Atlantic, most of the Northeast region, and portions of the interior Southeast and lower Mississippi valley region.

Table 3 shows extremes, 1961-90 normals, and the August 1995 values for both precipitation and temperature for the nine regions and the contiguous U.S.

Precipitation averaged across the Primary Corn and Soybean Belt was above normal for the six-month growing season to date (Figure 10). The last seven March-August periods have averaged at, to much wetter than, the long-term mean.

According to preliminary data from the National Weather Service's National Severe Storms Forecast Center, there were 55 tornadoes across the contiguous United States in August 1995. The 1953-1994 average tornado count for August is 60. Extremes for August include a minimum of 20 tornadoes in 1957 and a maximum of 127 in 1979.

For the year-to-date, 1011 tornadoes have occurred. The January-August average is 686. The year-to-date extremes are 1067 in 1991 and 377 in 1953. It should be noted that the preliminary tornado count is generally higher than the final count.

UNITED STATES SUMMER CLIMATE IN HISTORICAL PERSPECTIVE

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Preliminary data for summer (June-August) 1995 indicate that temperature averaged across the contiguous United States was above the long-term mean, ranking as the 33rd warmest summer on record (Table 4). Summer 1995, with an averaged temperature of 72.3°F, marked the second consecutive summer with above-average national temperatures and stands in contrast to the cool summers of 1992 and 1993 (Figure 11). One fourth (24.3%) of the country averaged much warmer than normal while 5.2% of the country averaged much cooler than normal for summer 1995.

Areally-averaged June through August precipitation for the nation was below the long-term mean, ranking 1995 as the 24th driest summer in the 101-year record (Table 4). Summer 1995 stands in sharp contrast to the wetness of the previous three years (Figure 12). The national standardized precipitation index (Figure 13) ranked 1995 as the eleventh driest summer on record, comparable in magnitude to the recent summers of 1980 and 1988. (Page 1 explains how this index is computed.) A fourth (24.6%) of the contiguous U.S. averaged much drier than normal for June-August 1995, while 8.7% experienced much wetter than normal conditions.

The temperature and precipitation ranks for summer 1995 for the nine climatically homogeneous regions in the United States are listed in Table 4. The average summer precipitation pattern was characterized by extreme dryness in the Northeast and Southwest regions, wetter-than-average conditions in the west coast regions (West and Northwest), and conditions in the middle third of the historical distribution for the remaining regions. Regional summer temperatures followed a simple pattern, with unusual warmth in the regions along and east of the Mississippi River, cooler-than-average conditions in the west coast regions, and moderate conditions in between. The Southwest region had the fourth driest summer on record, while the East North Central ranked fifth warmest and Central region eleventh warmest.

Dual extremes (see Table 4) occurred in the two northern corners of the country. The Northeast region had the second driest (Figure 14) and third warmest (Figure 15) summer on record, while the Northwest region ranked 15th wettest (Figure 16) and 18th coolest (Figure 17). In the Northeast, summer 1995 was as dry as the summers of the mid-1960's (Figure 14), raising concerns in many communities about water shortages. Among the differences, however, are the fact that summer 1995 followed an unusually wet summer in 1994 while the mid-1960's were persistently dry summer after summer. This summer also marked the third consecutive summer with area-averaged Northeast temperatures well above the long-term mean (Figure 15).

On a statewide basis, 14 states (AL, AZ, DE, KY, ME, MD, NE, NJ, NM, NY, PA, RI, VT, and WV)

ranked in the top ten driest category for summer 1995 (Figure 19B), with two of them (Maine and New Mexico) having the driest summer on record. Three states (CA, NC, and SC) ranked in the top ten wettest category. Fifteen states (IL, IN, LA, ME, MD, MI, MN, NH, NY, OH, PA, VT, VA, WV, and WI) ranked in the top ten warmest category (Figure 19A), with Wisconsin having the warmest summer on record in 1995. Summer 1995 precipitation ranks for eighteen river basins in the contiguous U.S. are shown in Table 6. It should be noted that the 1995 temperature and precipitation ranks are based on preliminary data, and the ranks will change when the final data are processed.

According to preliminary data from the National Weather Service's National Severe Storms Forecast Center, there were 455 tornadoes across the contiguous United States during summer 1995 (Figure 18). The 1953-1994 average for the summer is 320. The extremes: 166 summer tornadoes in 1953 and 729 in 1992. It should be noted that the preliminary tornado count is generally higher than the final count and that the tornado observations have generally improved with time as better observing practices and instrumentation (especially weather radar and satellites) were utilized.

TABLE 1. PRECIPITATION AND TEMPERATURE RANKS, BASED ON THE PERIOD 1895-1995. 1 = DRIEST/COLDEST, 101 = WETTEST/WARMEST FOR AUGUST 1995, 101 = WETTEST/WARMEST FOR JUL-AUG 1995, 101 = WETTEST/WARMEST FOR MAR-AUG 1995, 100 = WETTEST/WARMEST FOR SEP 1994-AUG 1995.

REGION	AUG 1995	JUL-AUG 1995	MAR-AUG 1995	SEP 1994-AUG 1995
PRECIPITATION:				
NORTHEAST	2	3	1	2
EAST NORTH CENTRAL	89	78	68	60
CENTRAL	59	28	81	56
SOUTHEAST	51	14	26	61
WEST NORTH CENTRAL	21	40	95	93
SOUTH	34	30	79	72
SOUTHWEST	8	1	53	77
NORTHWEST	66	75	97	74
WEST	46	23	101	99
NATIONAL	26	11	83	83
TEMPERATURE:				
NORTHEAST	90	98	85	91
EAST NORTH CENTRAL	96	93	76	96
CENTRAL	99	97	86	88
SOUTHEAST	97	97	87	82
WEST NORTH CENTRAL	83	61	30	74
SOUTH	87	84	45	75
SOUTHWEST	99	93	38	80
NORTHWEST	12	15	41	74
WEST	73	55	26	52
NATIONAL	98	92	53	93

TABLE 2.
STATISTICS FOR SELECTED RIVER BASINS: PRECIPITATION RANKING FOR OCT-AUG 1994-95, WHERE RANK OF 1 = DRIEST, 100 = WETTEST, BASED ON THE PERIOD 1895 TO 1995, AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) DROUGHT, AND AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) WET CONDITIONS, AS OF AUGUST 1995.
RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER RESOURCES COUNCIL.

RIVER BASIN	PRECIPITATION RANK	% AREA DRY	% AREA WET
MISSOURI BASIN	98	.0%	52.7%
PACIFIC NORTHWEST BASIN	94	.0%	29.4%
CALIFORNIA RIVER BASIN	98	.0%	71.2%
GREAT BASIN	99	.0%	100.0%
UPPER COLORADO BASIN	86	.0%	6.6%
LOWER COLORADO BASIN	77	.0%	.0%
RIO GRANDE BASIN	40	48.1%	3.9%
ARKANSAS-WHITE-RED BASIN	89	6.7%	30.9%
TEXAS GULF COAST BASIN	92	.0%	29.7%
SOURIS-RED-RAINY BASIN	81	.0%	59.2%
UPPER MISSISSIPPI BASIN	87	.0%	18.0%
LOWER MISSISSIPPI BASIN	64	.0%	.0%
GREAT LAKES BASIN	22	23.4%	4.5%
OHIO RIVER BASIN	42	23.5%	12.2%
TENNESSEE RIVER BASIN	27	.0%	.0%
NEW ENGLAND BASIN	3	41.6%	.0%
MID-ATLANTIC BASIN	3	44.6%	.0%
SOUTH ATLANTIC-GULF BASIN	69	5.9%	2.2%

TABLE 3. EXTREMES, 1961-90 NORMALS, AND 1995 VALUES FOR AUGUST

	PRECIPITATION (INCHES)					
	DRIEST		WETTEST		NORMAL	1995
REGION	VALUE	YEAR	VALUE	YEAR	PCPN	PCPN
NORTHEAST	1.78	1957	8.01	1955	3.87	2.16
EAST NORTH CENTRAL	1.35	1930	6.27	1980	3.73	4.76
CENTRAL	1.55	1953	6.30	1915	3.71	3.74
SOUTHEAST	2.71	1930	9.78	1901	5.19	5.24
WEST NORTH CENTRAL	.77	1967	3.03	1968	1.71	1.27
SOUTH	1.22	1943	6.06	1915	2.98	2.47
SOUTHWEST	.56	1962	3.25	1963	1.96	1.07
NORTHWEST	.10	1967	2.98	1968	.96	.83
WEST	.00	1911	2.01	1983	.50	.24
NATIONAL	1.76	1929	3.55	1977	2.66	2.33

	TEMPERATURE (DEGREES F)					
	COLDEST		WARMEST		NORMAL	1995
REGION	VALUE	YEAR	VALUE	YEAR	TEMP	TEMP
NORTHEAST	62.9	1903	71.9	1937	67.4	70.2
EAST NORTH CENTRAL	63.0	1915	74.6	1947	67.6	72.7
CENTRAL	68.9	1915	79.8	1936	73.4	79.3
SOUTHEAST	75.8	1967	81.3	1900	78.0	80.3
WEST NORTH CENTRAL	63.0	1911	73.0	1983	67.4	69.4
SOUTH	76.2	1992	84.5	1943	80.2	82.8
SOUTHWEST	68.1	1968	74.6	1994	71.3	74.4
NORTHWEST	59.2	1899	69.4	1967	65.2	62.4
WEST	67.2	1899	75.7	1958	72.4	73.5
NATIONAL	70.0	1927	75.4	1983	72.3	74.8

TABLE 4. TEMPERATURE AND PRECIPITATION RANKS FOR JUN-AUG 1995, BASED ON THE PERIOD 1895-1995. 1 = DRIEST/COLDEST, 101 = WETTEST/HOTTEST.

REGION	PRECIPITATION	TEMPERATURE
NORTHEAST	2	99
EAST NORTH CENTRAL	45	97
CENTRAL	39	91
SOUTHEAST	54	78
WEST NORTH CENTRAL	53	51
SOUTH	36	51
SOUTHWEST	4	51
NORTHWEST	87	18
WEST	81	28
NATIONAL	24	69

TABLE 5. EXTREMES, 1961-90 NORMALS, AND 1995 VALUES FOR SUMMER (JUN-AUG)

	PRECIPITATION (INCHES)					
	DRIEST		WETTEST		NORMAL	1995
REGION	VALUE	YEAR	VALUE	YEAR	PCPN	PCPN
NORTHEAST	7.36	1913	15.15	1903	11.52	7.42
EAST NORTH CENTRAL	6.51	1910	16.40	1993	11.23	10.81
CENTRAL	6.32	1930	17.35	1958	11.91	11.47
SOUTHEAST	10.63	1980	21.76	1906	15.61	15.97
WEST NORTH CENTRAL	3.74	1917	12.11	1993	6.46	6.53
SOUTH	5.31	1954	13.55	1950	9.67	9.05
SOUTHWEST	2.75	1900	7.81	1921	4.72	3.03
NORTHWEST	.80	1919	5.47	1983	3.17	4.04
WEST	.24	1905	2.66	1913	1.30	1.43
NATIONAL	5.98	1930	10.24	1928	8.24	7.69

	TEMPERATURE (DEGREES F)					
	COLDEST		WARMEST		NORMAL	1995
REGION	VALUE	YEAR	VALUE	YEAR	TEMP	TEMP
NORTHEAST	63.8	1903	70.4	1949	67.0	69.6
EAST NORTH CENTRAL	63.0	1915	71.5	1988	67.7	70.7
CENTRAL	70.5	1915	78.1	1934	73.3	75.9
SOUTHEAST	75.5	1967	80.1	1952	77.5	78.6
WEST NORTH CENTRAL	61.5	1915	71.4	1936	66.7	66.5
SOUTH	77.3	1992	83.8	1934	79.7	80.2
SOUTHWEST	68.2	1907	74.1	1994	71.0	70.8
NORTHWEST	59.5	1993	67.2	1961	63.7	62.0
WEST	68.1	1907	74.3	1918	71.3	70.3
NATIONAL	69.5	1915	74.3	1936	71.7	72.3

TABLE 6.
STATISTICS FOR SELECTED RIVER BASINS: PRECIPITATION RANKING FOR JUN-AUG 1995, WHERE RANK OF 1 = DRIEST, 101 = WETTEST, BASED ON THE PERIOD 1895 TO 1995. RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER RESOURCES COUNCIL.

RIVER BASIN	PRECIPITATION RANK
MISSOURI BASIN	41
PACIFIC NORTHWEST BASIN	90
CALIFORNIA RIVER BASIN	95
GREAT BASIN	55
UPPER COLORADO BASIN	22
LOWER COLORADO BASIN	4
RIO GRANDE BASIN	2
ARKANSAS-WHITE-RED BASIN	59
TEXAS GULF COAST BASIN	62
SOURIS-RED-RAINY BASIN	55
UPPER MISSISSIPPI BASIN	47
LOWER MISSISSIPPI BASIN	24
GREAT LAKES BASIN	37
OHIO RIVER BASIN	37
TENNESSEE RIVER BASIN	19
NEW ENGLAND BASIN	1
MID-ATLANTIC BASIN	3
SOUTH ATLANTIC-GULF BASIN	58

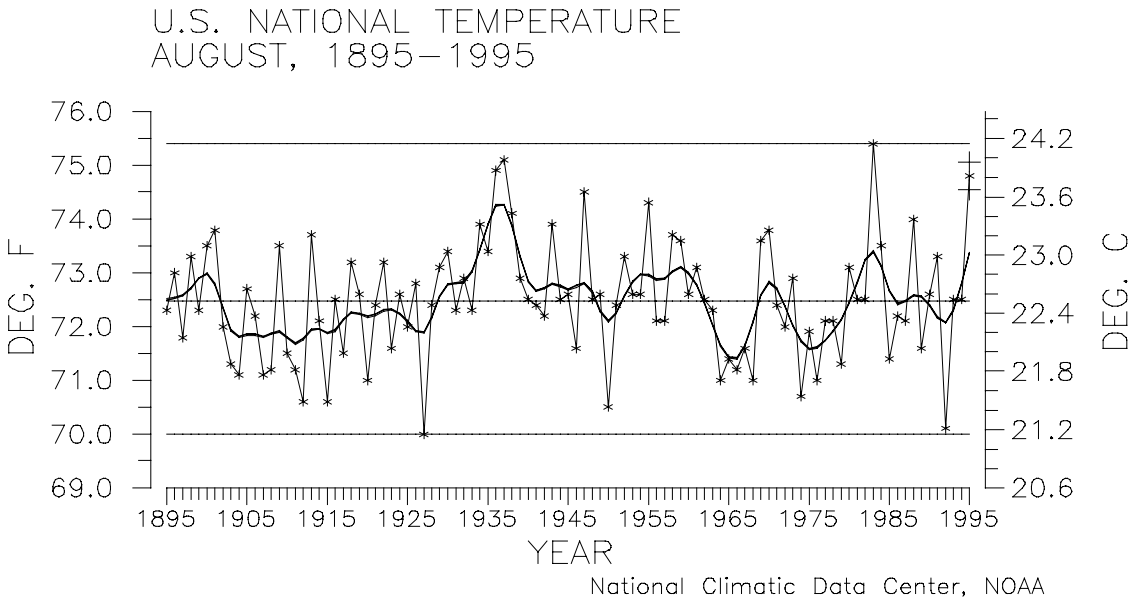

Figure 1

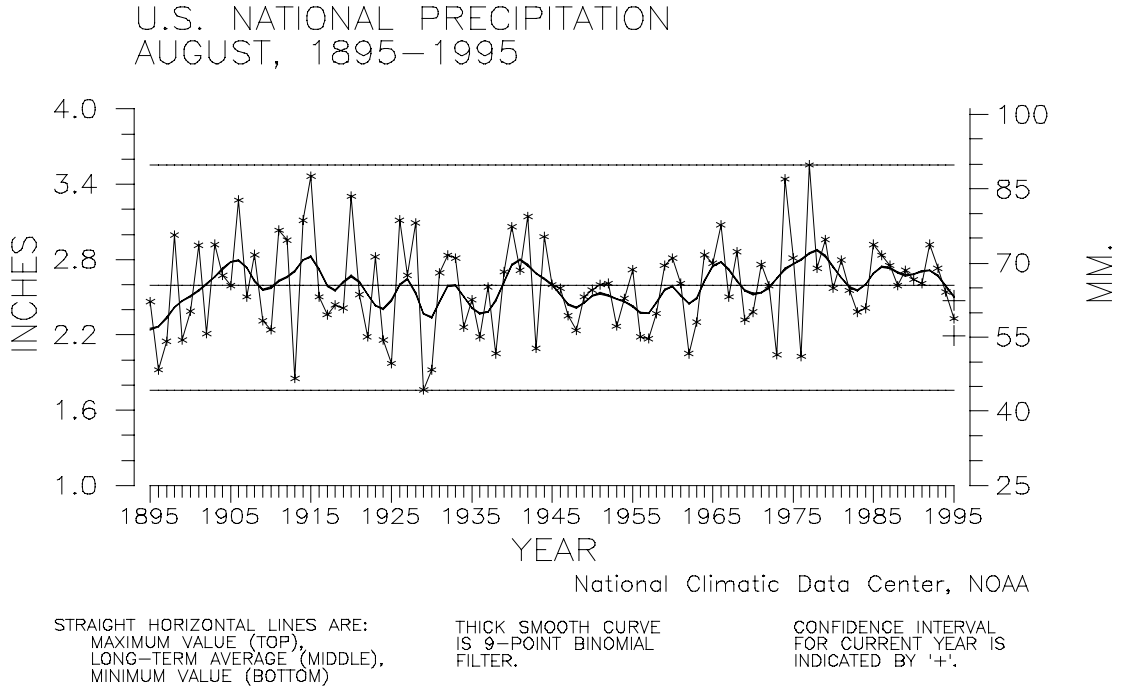

Figure 2

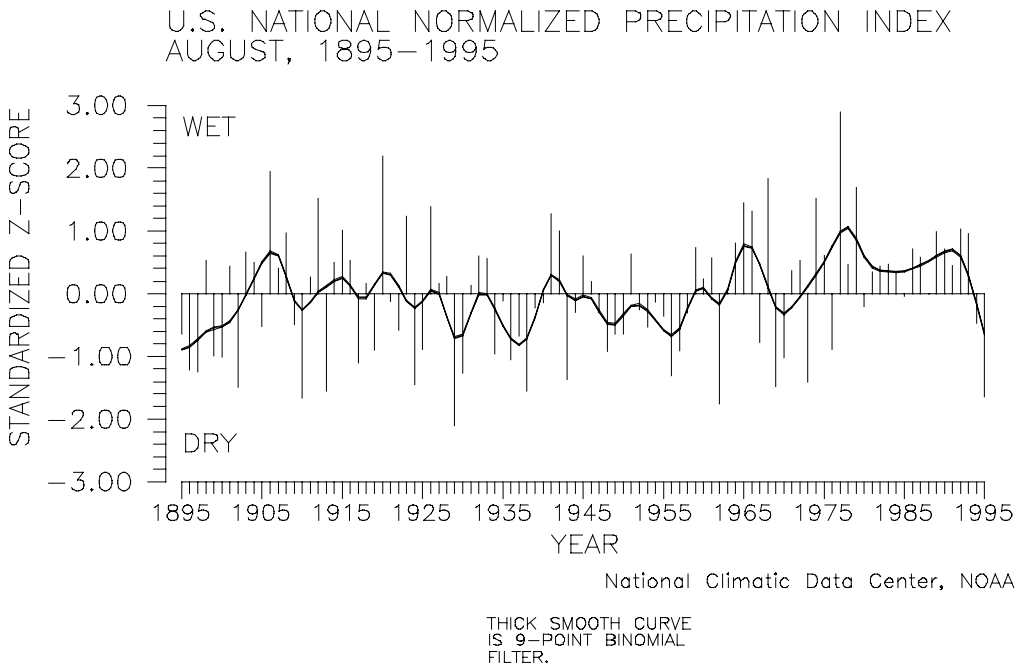

Figure 3

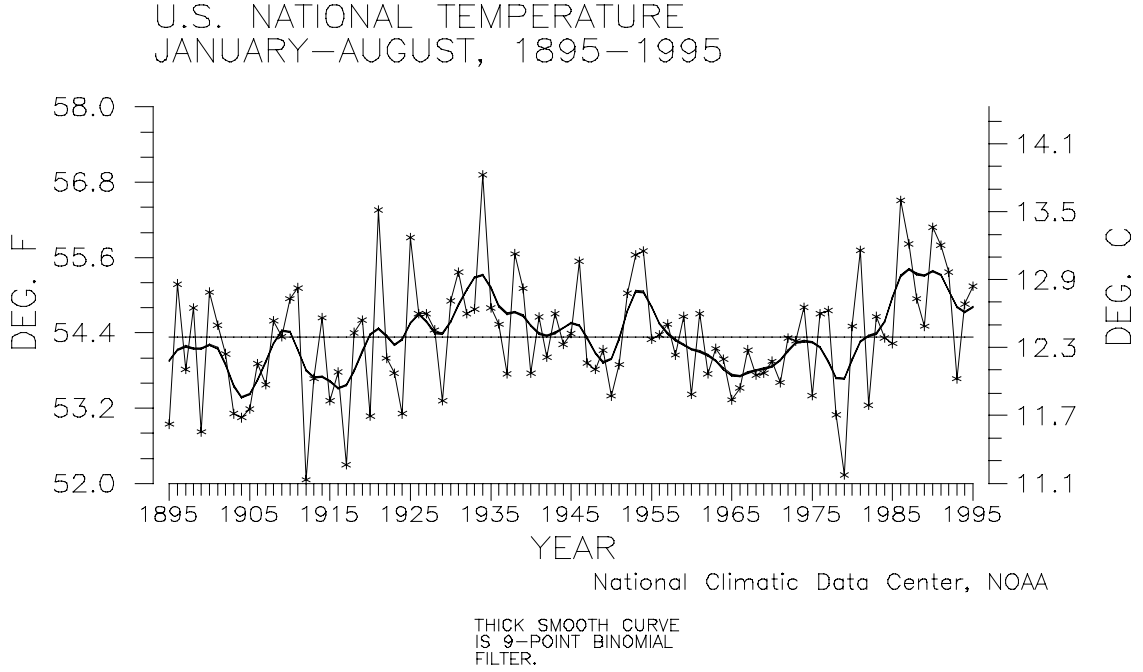

Figure 4

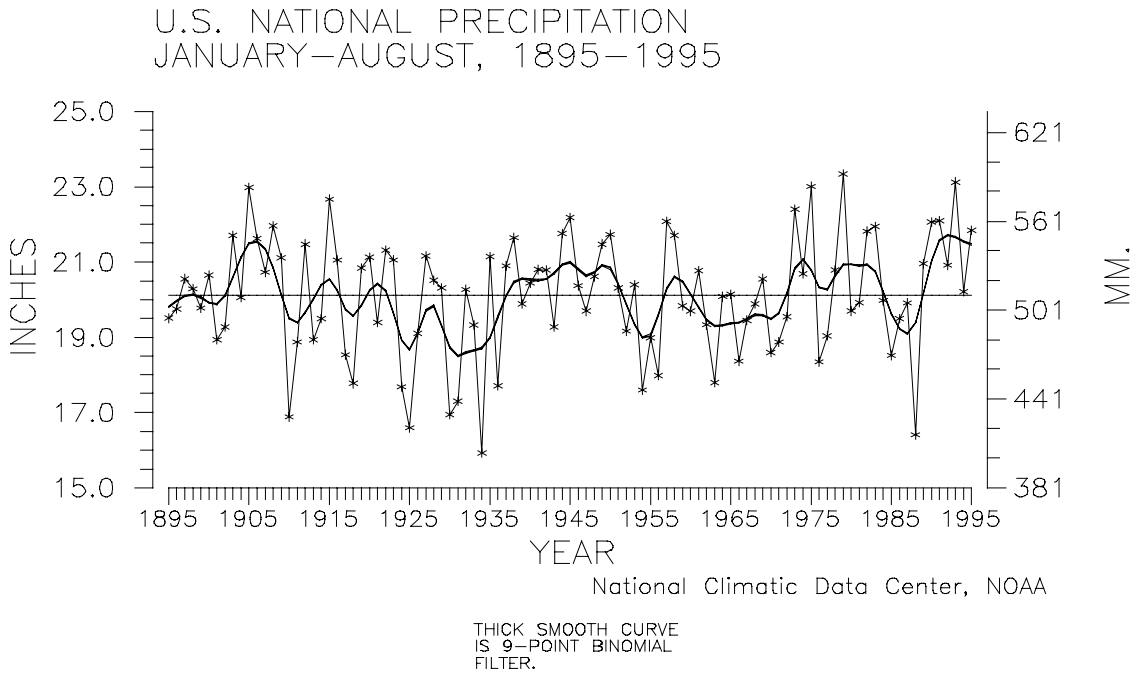

Figure 5

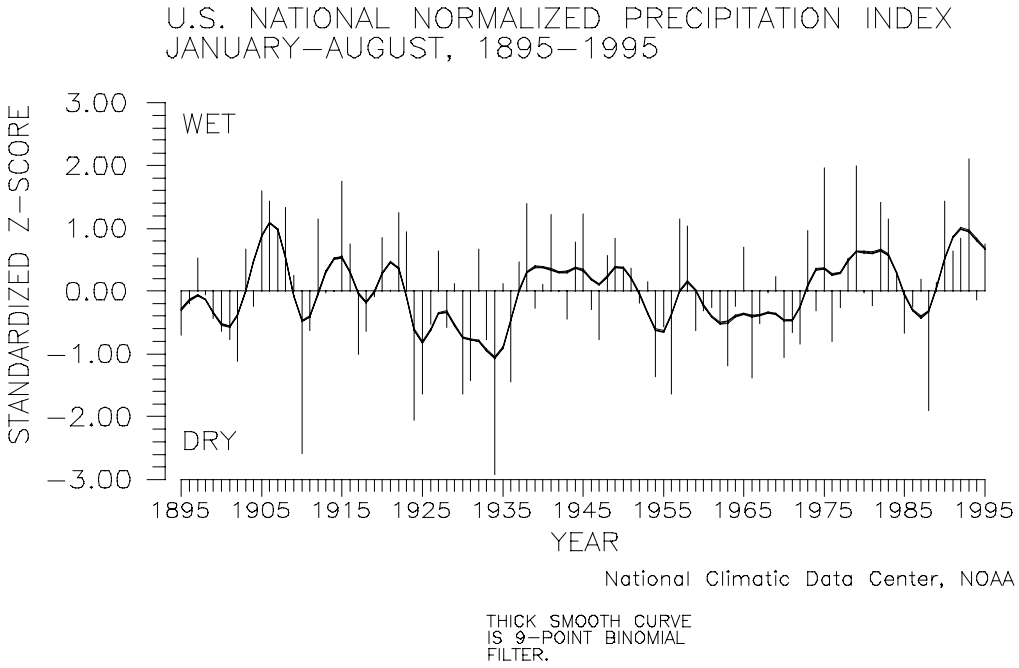

Figure 6

AUGUST 1995 STATEWIDE RANKS

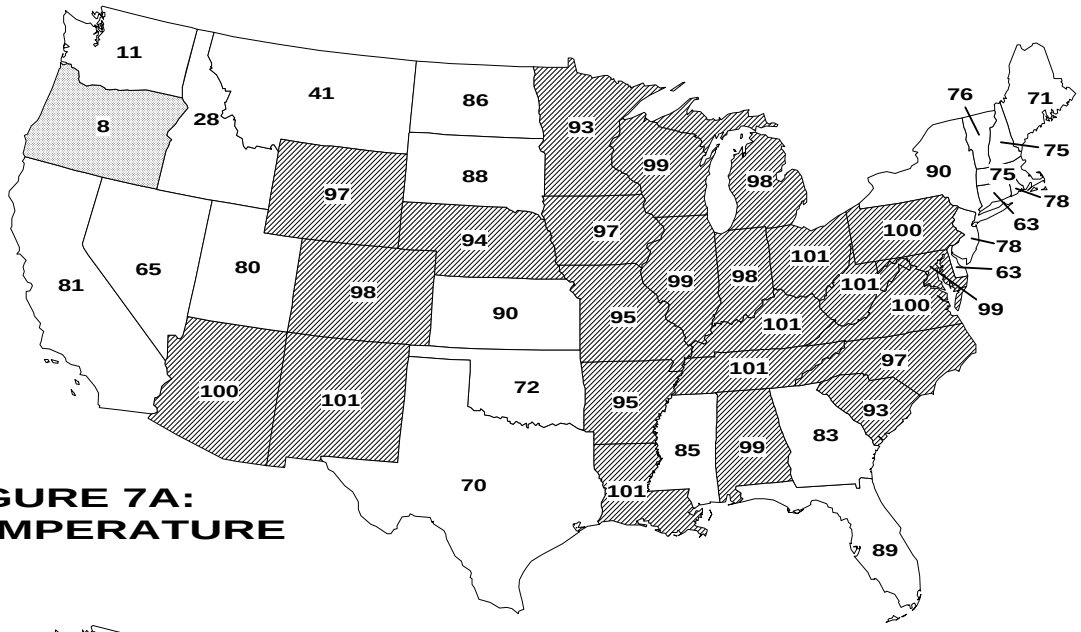

FIGURE 7A: TEMPERATURE

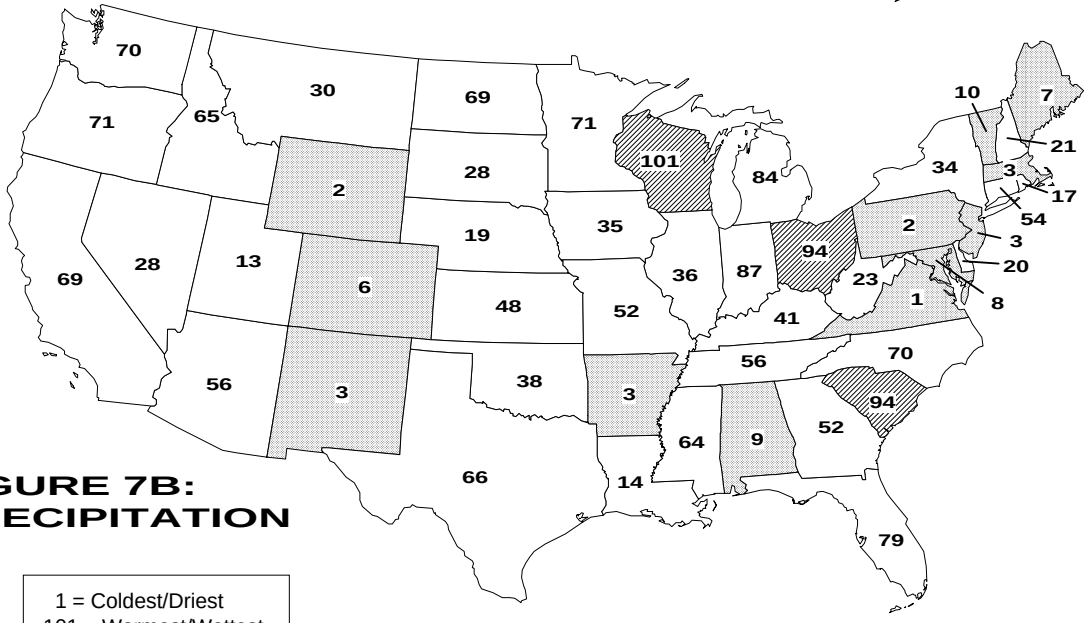

FIGURE 7B: PRECIPITATION

1 = Coldest/Driest
101 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1995. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 92-101) are shaded.

JAN-AUG 1995 STATEWIDE RANKS

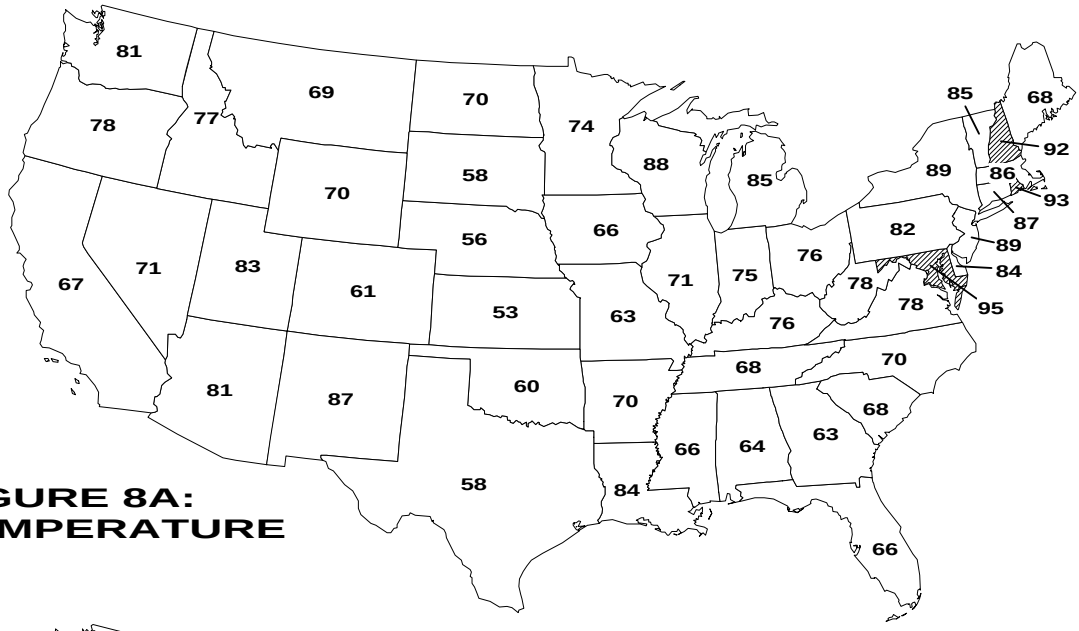

FIGURE 8A: TEMPERATURE

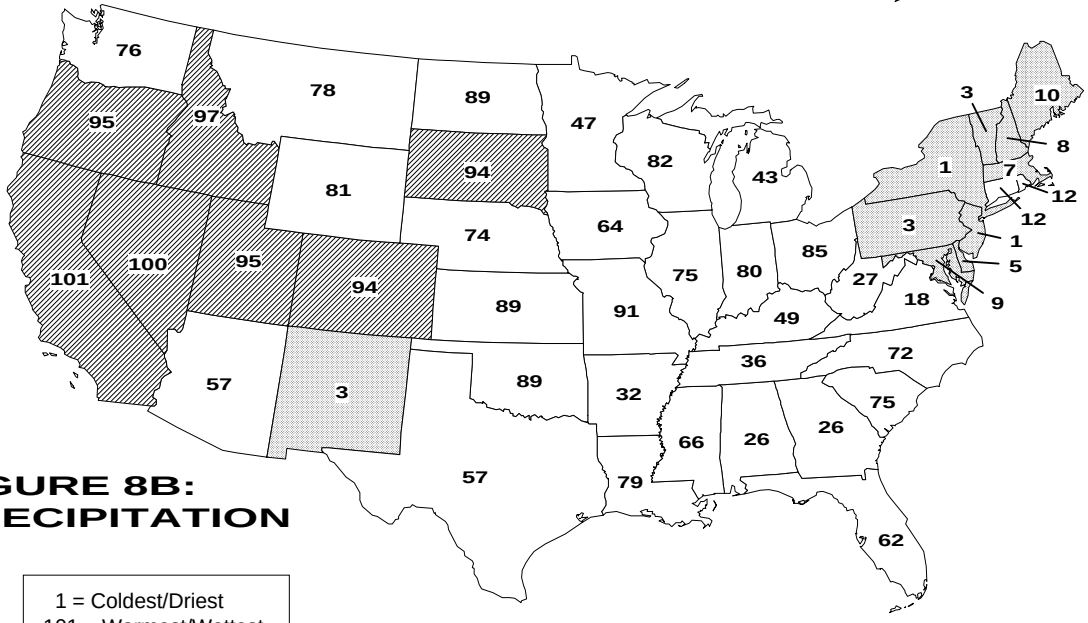

FIGURE 8B: PRECIPITATION

1 = Coldest/Driest
101 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1995. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 92-101) are shaded.

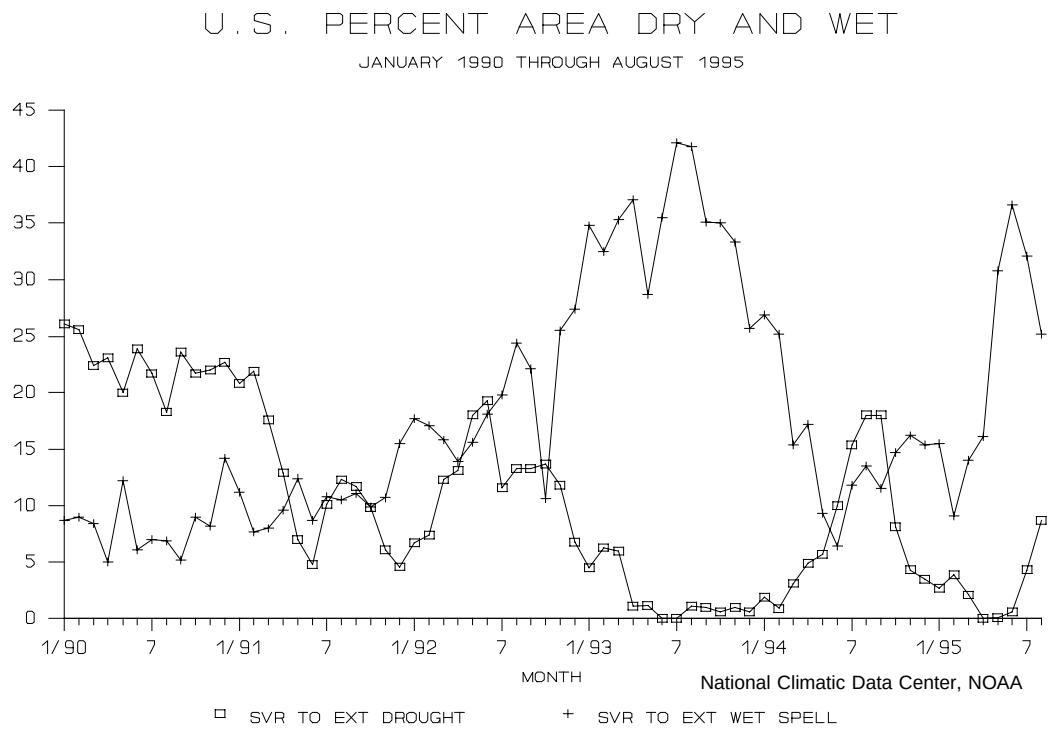

Figure 9

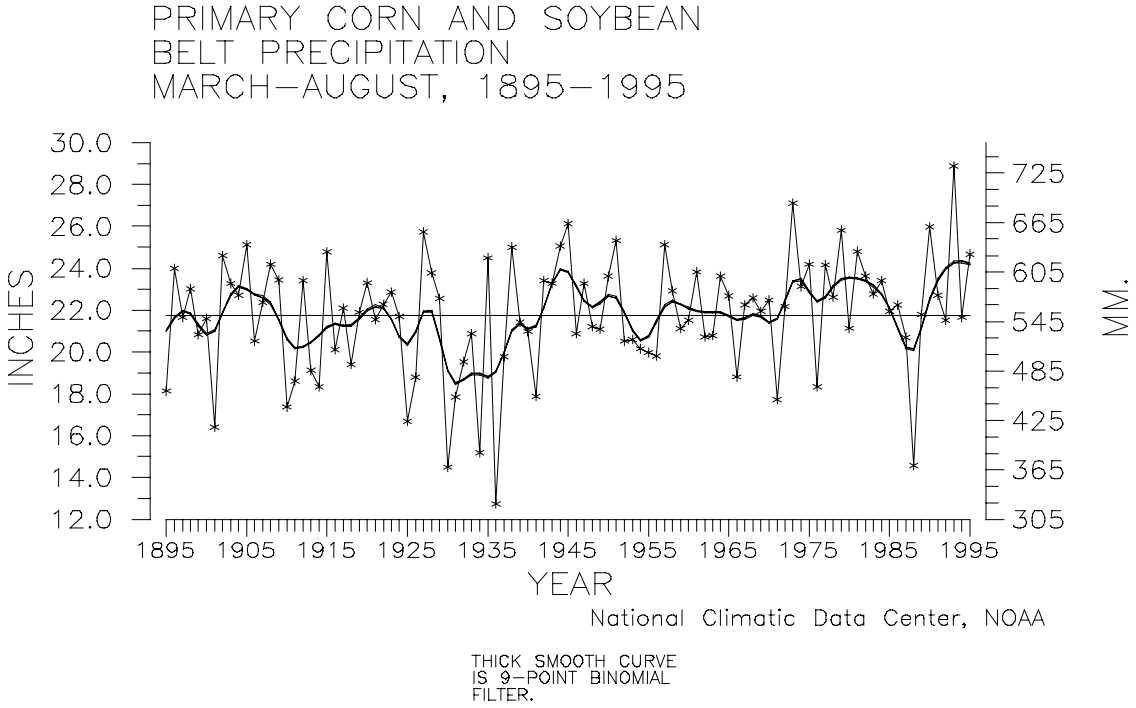

Figure 10

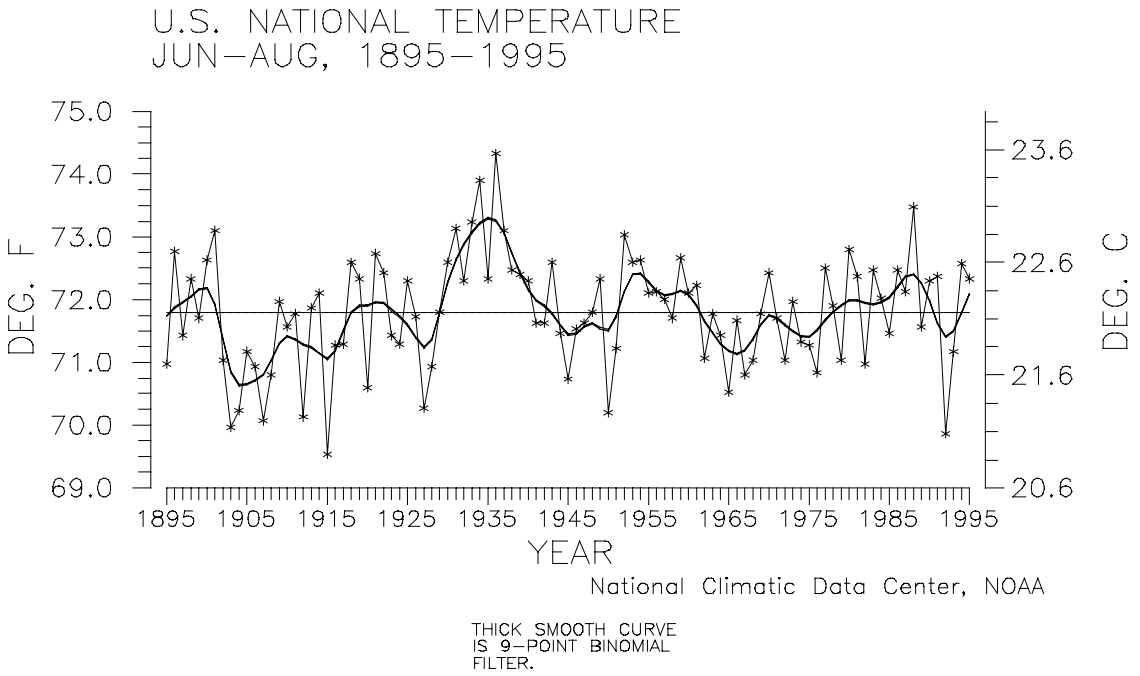

Figure 11

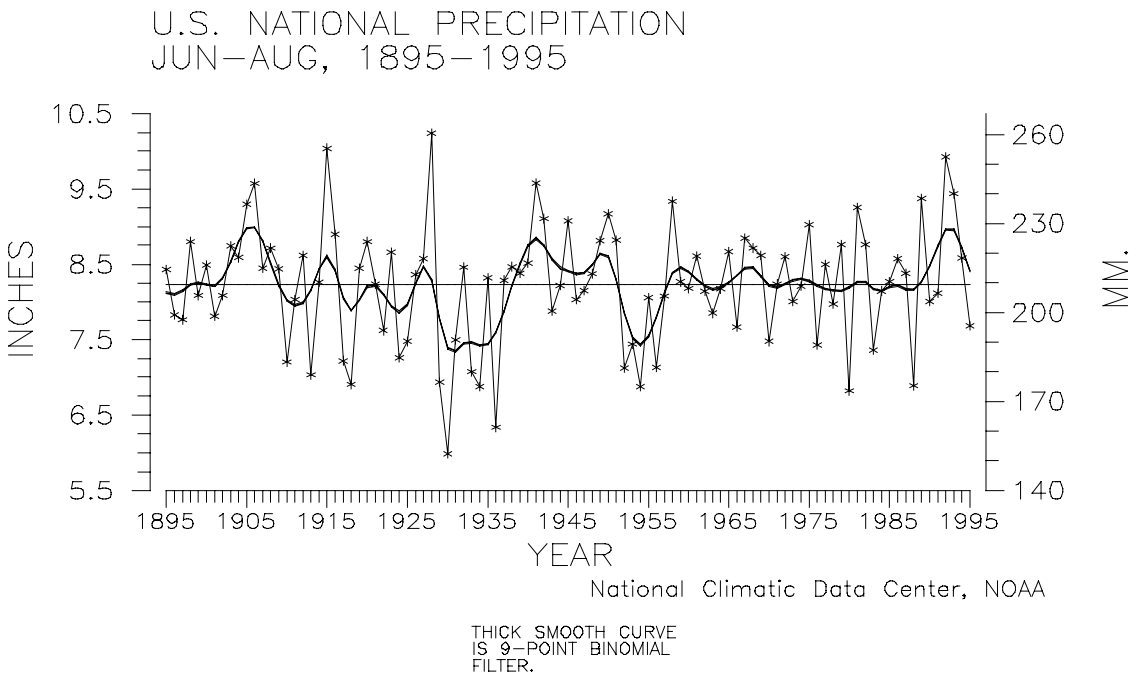

Figure 12

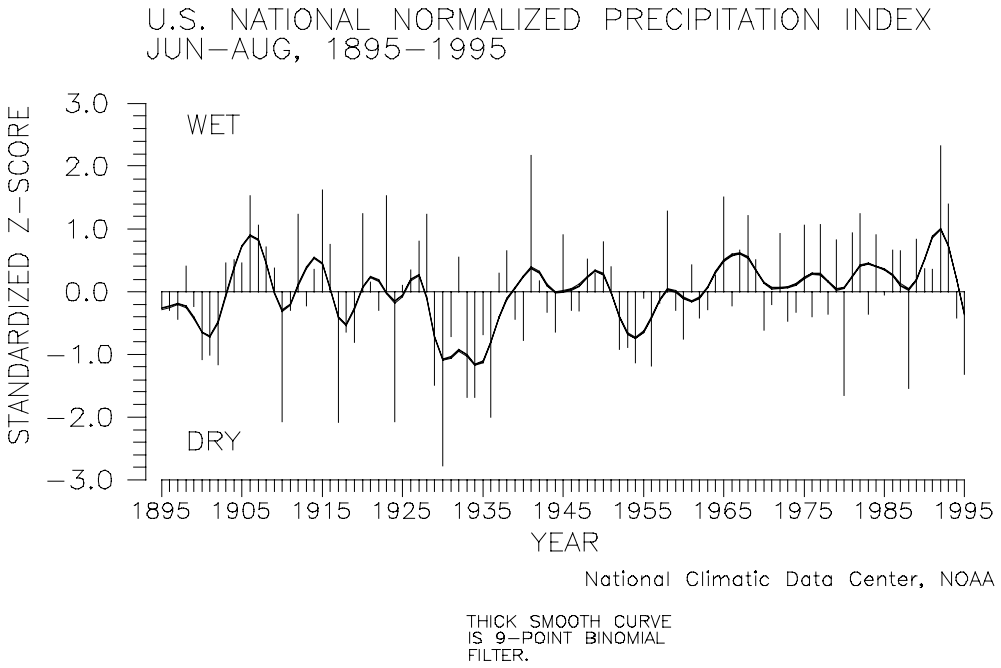

Figure 13

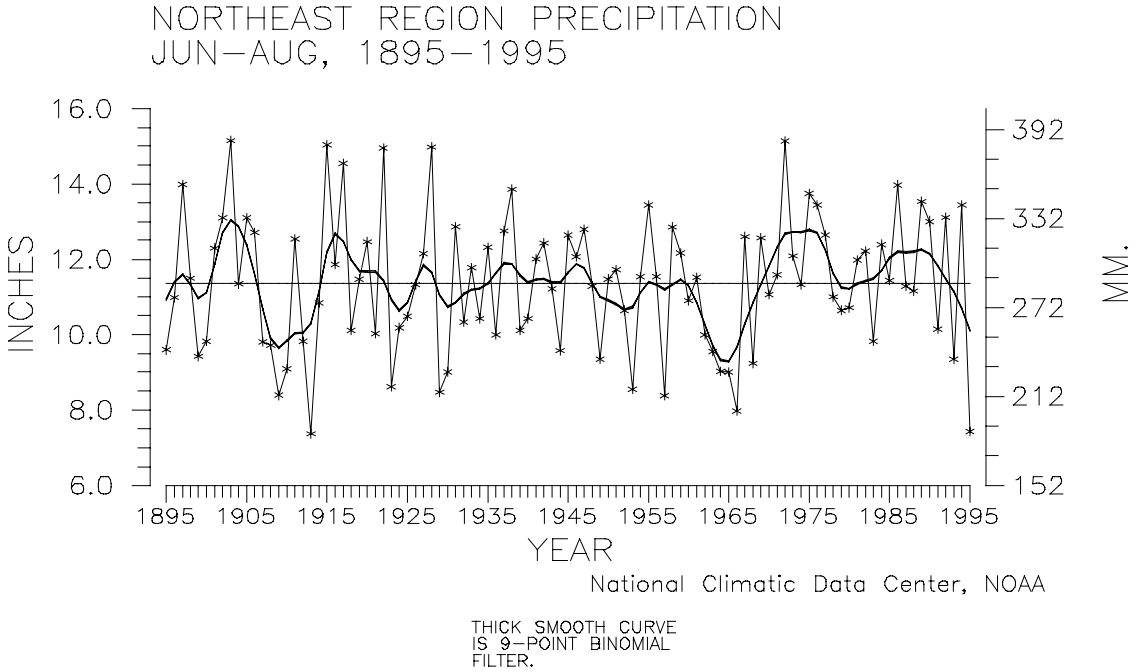

Figure 14

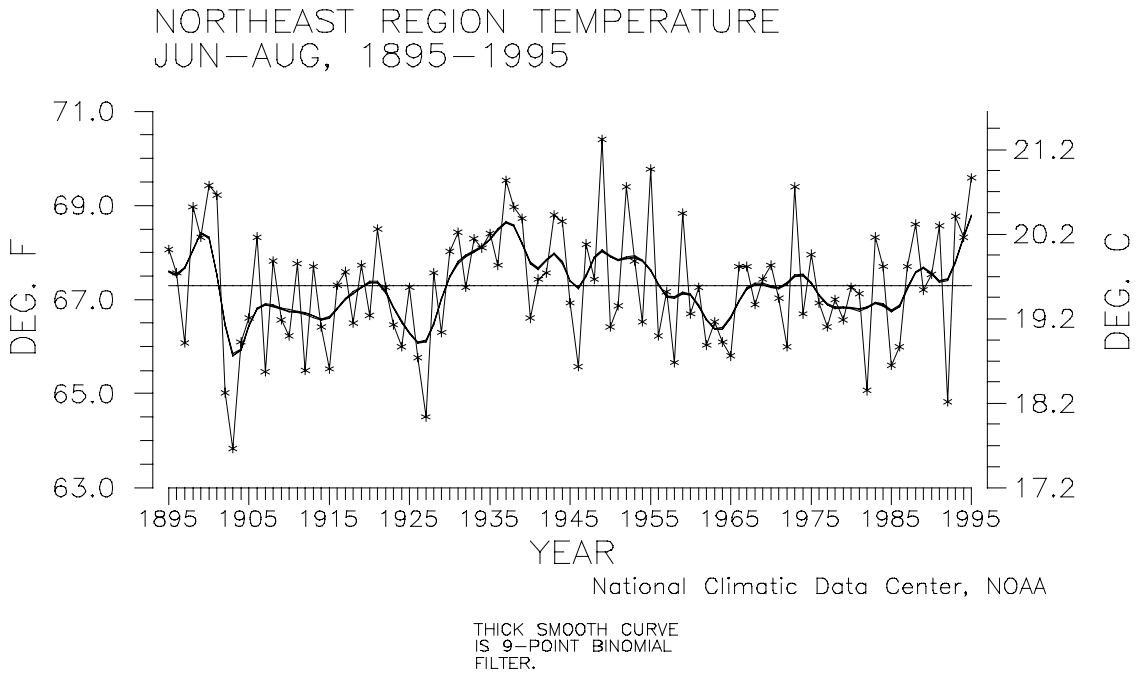

Figure 15

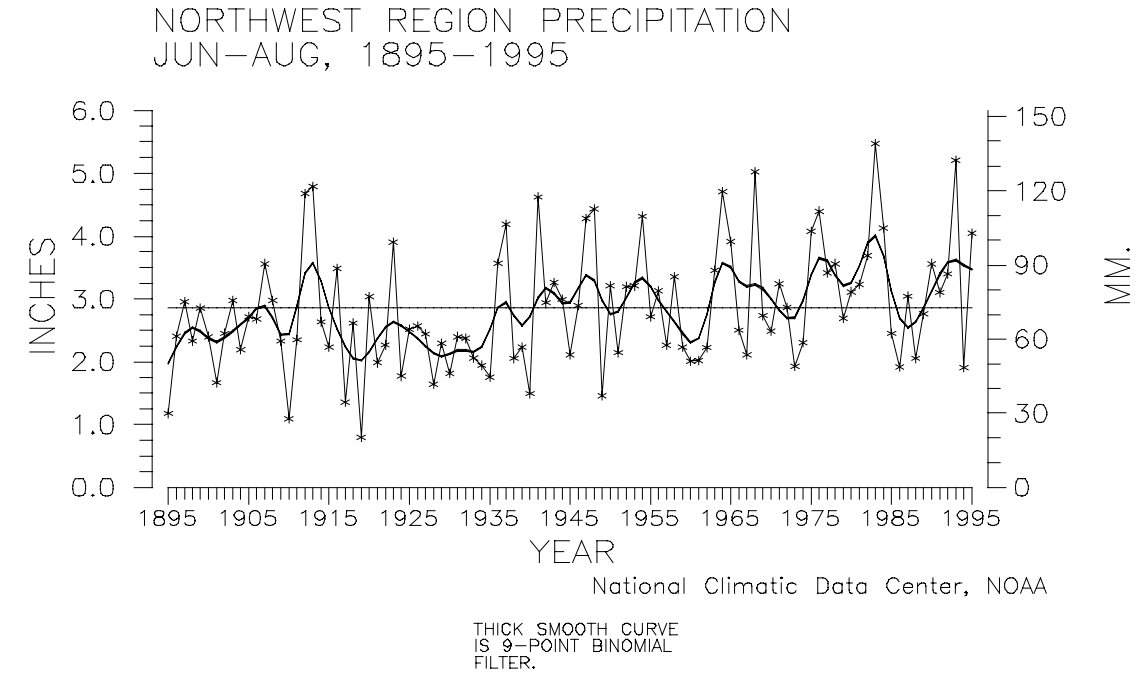

Figure 16

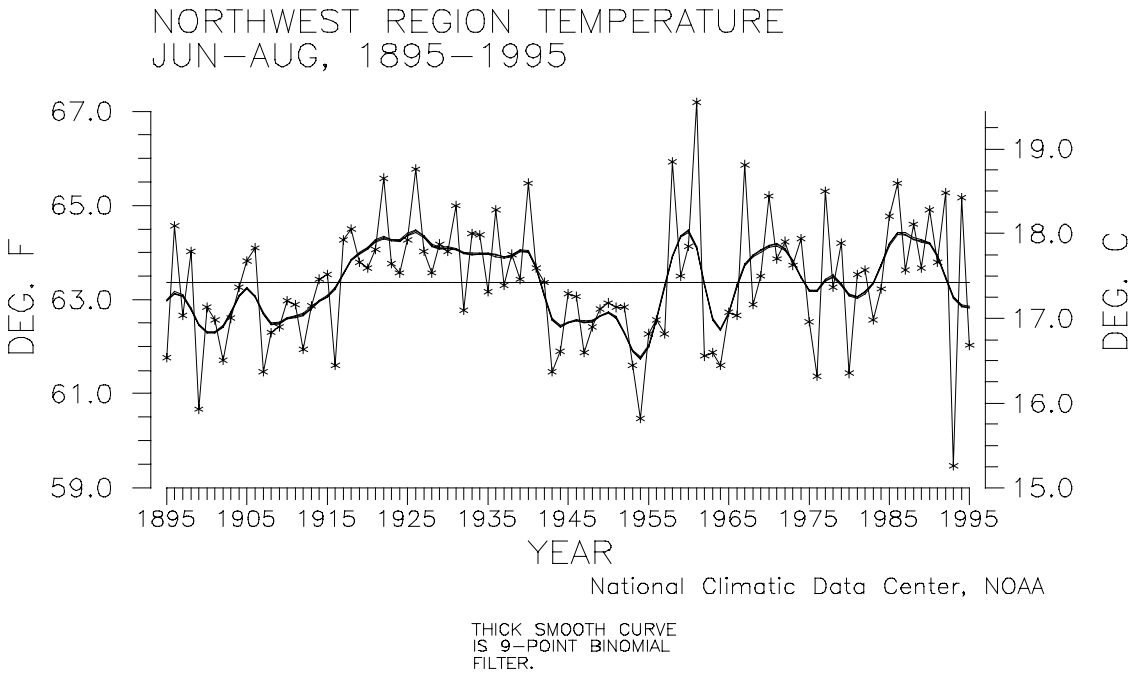

Figure 17

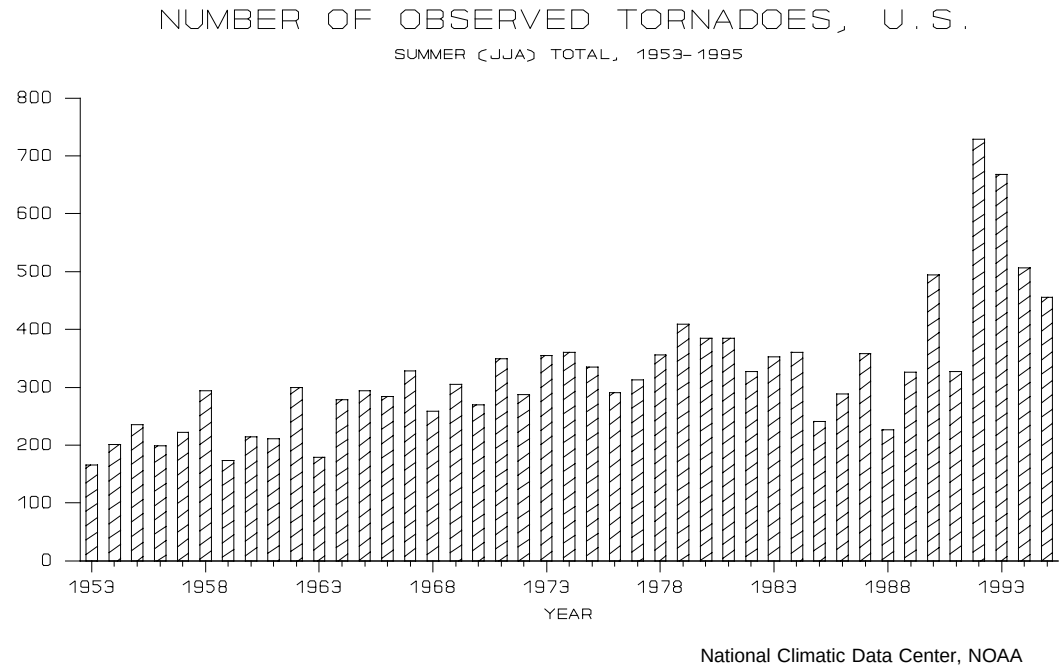

Figure 18

SUMMER (JJA) 1995 STATEWIDE RANKS

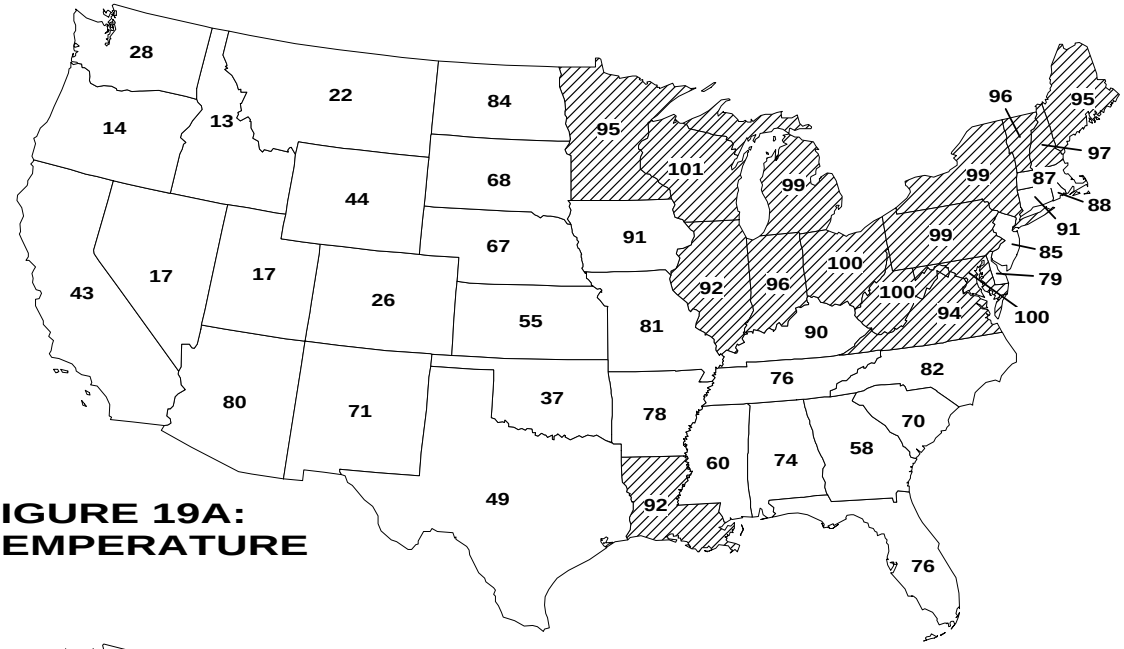

FIGURE 19A: TEMPERATURE

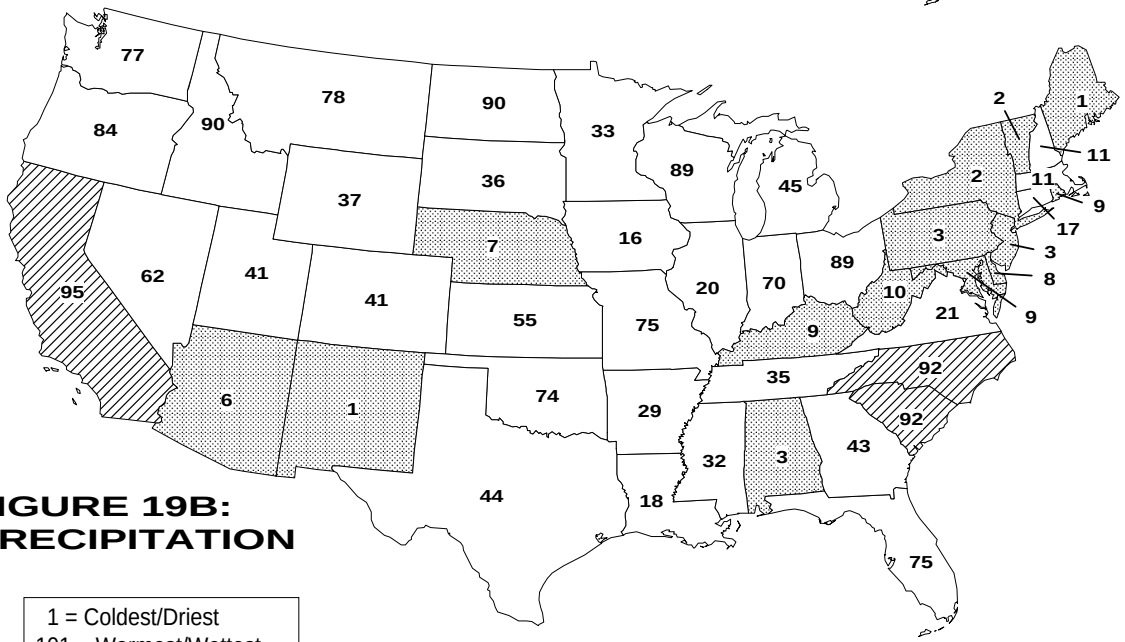

FIGURE 19B: PRECIPITATION

1 = Coldest/Driest
101 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1995. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 92-101) are shaded.